

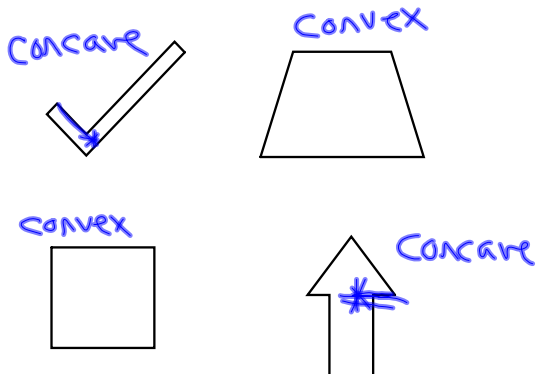
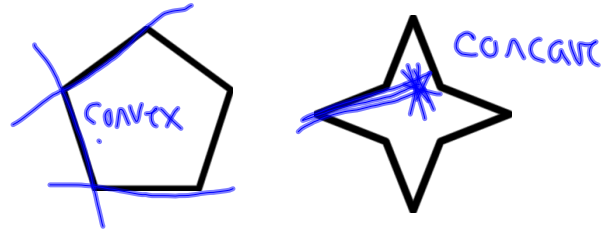
Chapter 8

Polygons and Area

8-1 Classifying Polygons

Convex--A polygon is convex, if the line containing a side does not pass through the interior of the polygon

Concave--Not convex



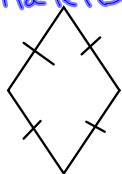
Equilateral--all sides congruent

Equiangular--all angles congruent

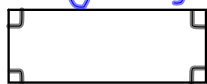
Regular--both equilateral and equiangular

↘ ex: square

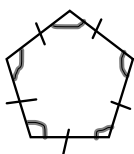
equilateral



equiangular

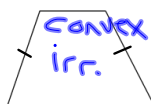


regular



Classify the following figures as:

- convex or concave
- regular or irregular



concave, irreg.

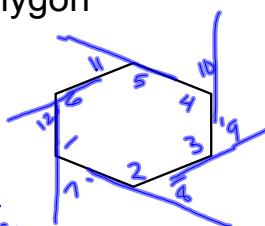


8-2 Angles of a Polygon

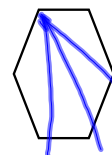
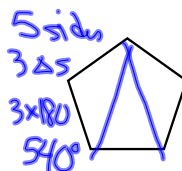
Interior angles

 $\angle 1 - \angle 6$ interior

Exterior angles

 $\angle 7 - \angle 12$ exterior

4 sides
2 Δ s
 2×180
 360°



6 sides
4 Δ s
 4×180
 720°

Theorem 8.1--Polygon Interior Angles Theorem

The sum of the measures of the interior angles of a convex polygon with n sides is $(n-2)180$.

$$\text{Sum of Interior} = (n-2)180$$

Find the sum of interior angles for:

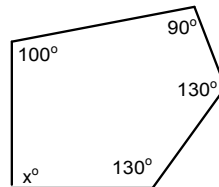
$$n = 7$$

$$(7-2)180 = 900^\circ$$

$$n = 15$$

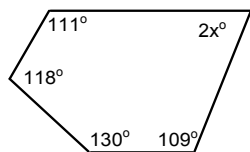
$$(15-2)180 = 2340^\circ$$

Find x .



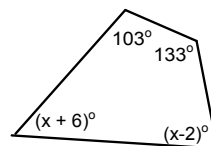
$$\text{Sum} = (5-2)180 = 540^\circ$$

$$\begin{aligned} x + 100 + 90 + 130 + 130 &= 540 \\ x + 450 &= 540 \\ x &= 90 \end{aligned}$$



$$\text{Sum} = (5-2)180 = 540$$

$$\begin{aligned} 2x + 109 + 130 + 118 + 111 &= 540 \\ 2x + 468 &= 540 \\ 2x &= 72 \\ x &= 36 \end{aligned}$$



$$\text{Sum} = (4-2)180 = 360$$

$$\begin{aligned} (x+6) + (x-2) + 133 + 103 &= 360 \\ 2x + 240 &= 360 \\ 2x &= 120 \\ x &= 60 \end{aligned}$$

Find each interior angle of a regular:

a. pentagon

$$\begin{aligned} \text{Sum} &= (5-2)180 \\ \text{Sum} &= 540 \end{aligned} \quad \frac{540}{5} = 108^\circ$$

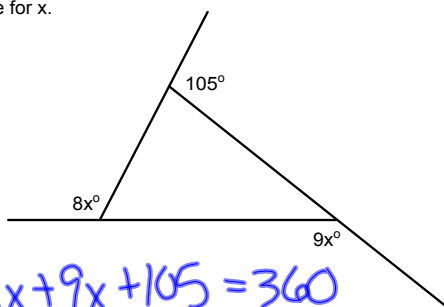
b. 12-gon

$$\begin{aligned} (12-2)180 &= \text{sum} \\ 1800 &= \text{sum} \end{aligned} \quad \frac{1800}{12} = 150^\circ$$

Theorem 8.2 The Polygon Exterior Angles Theorem--
The sum of the measures of the exterior angles of a convex polygon is 360° .

$$\text{Exterior Sum} = 360^\circ$$

Solve for x.



$$\begin{aligned} 8x + 9x + 105 &= 360 \\ 17x + 105 &= 360 \\ 17x &= 255 \\ x &= 15 \end{aligned}$$

HW

p413-414 7-17

p421 11, 12, 14, 17, 20, 21, 25